converting the srt to use silver oxide cells

by dick sullivan

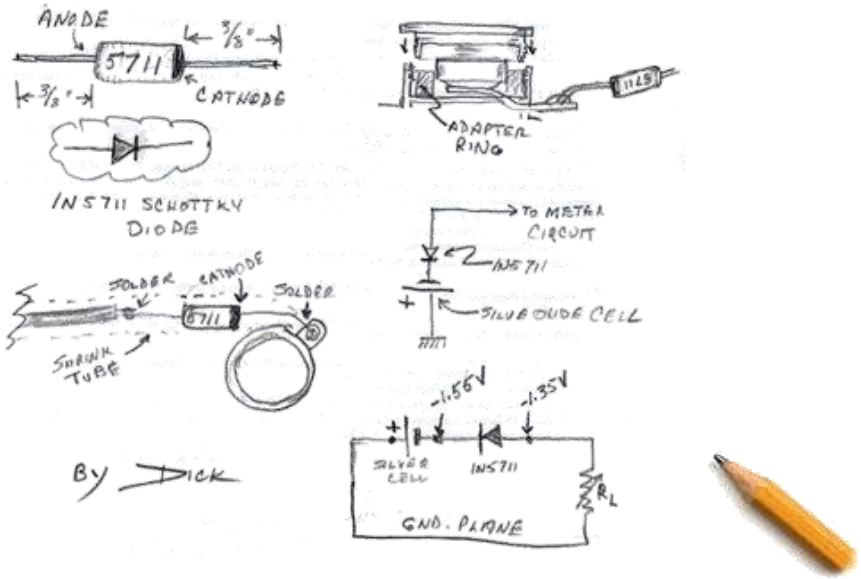
This article has been reconstructed from the excellent Minolta SR-T site created by Dick Sullivan, which is unfortunately now no longer on the web. Our thanks and respects go to Dick Sullivan for his committment to other Minolta manual focus users.

As described in the page about the Mercury Battery, many early cameras including the SRT were designed to operate on the now banned 1.35v mercury cell. In order to have the camera meter correctly with modern 1.5v cells the voltage of the cell must be reduced to 1.35v. Dick proposed that the easiest way to do this was to convert the SRT through the use of a Schottky diode. The conversion has been conducted and does work very well, reducing the voltage to the camera meter circuit to 1.35v. The conversion requires simple tools, some soldering skills, and the removal of the camera's bottom cover. Overall it takes about one hour.

required tools and parts

- A No. "0" Phillips Jewelers Screwdriver.
- A Small Soldering Iron with a pointed tip, 25 Watts or so.
- A 1N5711 Schottky Diode.
- A short (about 2") piece of insulating plastic tubing, with an 1/8" inside diameter.
- A short length of small gauge 60/40 solder.
- A Fresh '76 1.5 volt Silver Oxide Cell:
  - Duracell® MS76H
  - Kodak® KS76
  - Varta® V76PX
  - Panasonic® SP76
  - Rayovac® RS76
  - Energizer® EPX76 or 357
- Either a Plastic Adapter Ring, or a # 111 Rubber "O" Ring measuring approximately 5/8" outside dia. and 7/16" inside dia.

my initial notes



Technical Notes: *The 1N5711 Schottky Diode is a Metal to Silicon Junction Diode primarily intended for high level UHF/VHF detection and pulse applications. We of course, do not care about its frequency characteristics or its intended applications, just its forward voltage drop.*

Any forward biased diode will drop a certain amount of voltage depending on its type, construction, the current flowing through it and to some extent, its temperature. The type and construction of a diode used is the major factor in the amount of forward voltage drop it has. For instance, a Germanium diode will typically drop .4 volts or more and a Silicon diode will drop about .6 Volts, neither of these types will suit our needs. Since a Silver Oxide Cell delivers about 1.6 volts and a Mercury Cell reads about 1.35 volts we need a voltage drop of about .25 volts. It turns out that a forward biased 1N5711 Silicon Schottky Diode will drop the required .25 volts at the current range (10 ~ 200ua.) of the SRT metering circuit.

While temperature will affect this voltage drop a little, the effect will be extremely small at the temperature range of the camera in normal use. Photography in Antarctica or the Sahara Desert might be another story, but the mechanically operated SRT will likely have other problems long before those extreme temperature can cause any appreciable exposure errors. Temperatures of about 32° to 95° F, should be just fine. From my measurements at room temperature, the 1N5711 Schottky Diode was "spot on", reading a .25 volts drop, thus delivering 1.35 volts the SRT's metering circuit, perfect for our application. Other Schottky Diodes (1N6263, BAT41, BAT81, BAT82, BAT83) have a similar type and construction but I have not tested them.

Caution: *The handling of the diode, as with any semiconductor requires certain precautions to prevent damaging it. You should protect it from static discharges and excessive heat. Before touching the diode leads be sure to ground yourself to a grounded metal surface to discharge any build up of static on your body. When soldering the diode, try to limit the time of heating to about 2 seconds.*

conversion steps

1. Assure that the SRT was or is accurate with the Original Mercury Cell and is functioning properly, Film Transport, Shutter curtains, etc.

2. Unscrew the battery cover and remove the existing PX13 or PX625 Mercury Cell from the SRT camera, if still in place.

3. Clean the battery area and cover, paying particular attention to the battery contacts. You can use a Q-Tip® moistened with Rubbing alcohol. For corroded contacts, a pencil eraser works fine. Dirty or corroded contacts can cause erratic readings.

4. If you are using a Plastic Adapter Ring, install it into the battery compartment and then place the battery inside the adapter (+ side towards the cap). Alternately, install the "O" Ring around a fresh 1.5 volt Silver Oxide "76" Cell, and place it in the battery compartment. Observe the correct polarity (+ side towards the cap). The adapter or "O" ring is required since the Silver Oxide Cell is smaller in diameter than the Mercury Cell. The Adapter or "O" Ring will center the cell in the battery compartment and can be re-used. The Silver Oxide Cell is also slightly thinner (by about .030 inch), but should make no real difference as to fit. Should

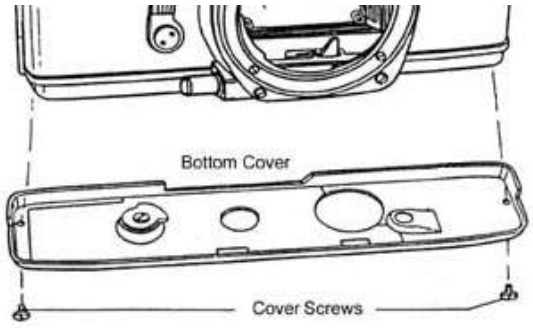
you experience intermittent battery contact, just bend the negative contact up a bit and that should solve the problem.

Original Mercury Cell

Silver Cell & O Ring

Silver Cell & Plastic Adapter

5. Remove the bottom cover of the camera by removing the two Phillips head screws at either end of the camera. The plate will easily lift off and expose the parts, needing access.



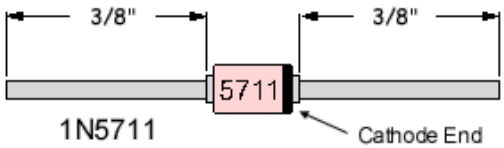
6. Examine the interior of the bottom assembly for defects such as broken wires or corrosion. Correct any defects before going on.

7. Remove the soft black plastic trim ring that goes around the battery container, making note of its original position and set it aside.

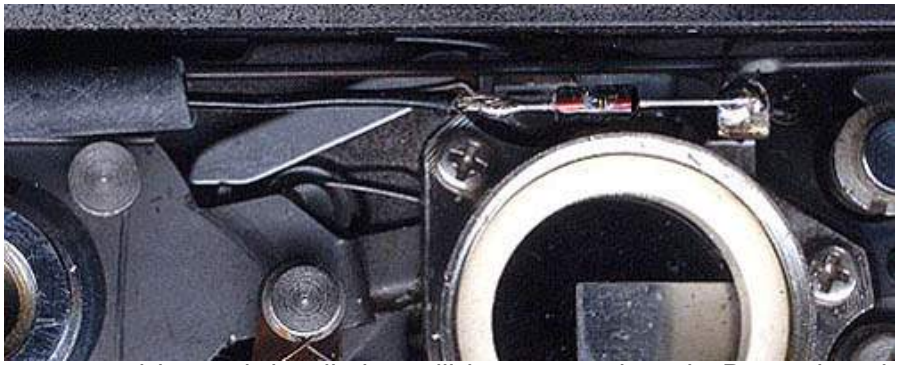
8. With a voltmeter, check to make sure that you have 1.6 volts between a good chassis ground point (+) and the tab (-) on the battery compartment.

9. Using a soldering iron with a small tip, unsolder the wire (usually black) from the negative (-) tab on the battery compartment.

10. Cut the leads of the diode to about 3/8" long. Solder the Cathode end (the end with the black band) to the tab that the wire was removed from. Do not over-heat the diode.



11. Put the plastic tubing over the wire just removed from the tab and push it on enough to expose the wire end.
12. Now solder the wire end to the free end of the diode. Again, do not over-heat the diode.



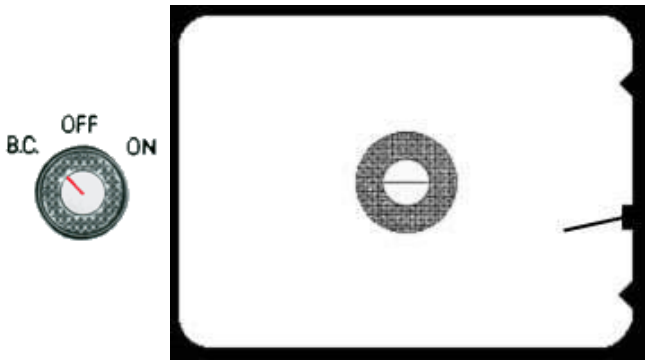
13. Push the insulation over and beyond the diode untill it contacts the tab. Dress the wire so it will not be pinched by the bottom cover or other mechanical parts.

14. Place the black plastic trim ring back on the battery container in the correct original position.

15. Replace the camera's Bottom cover, being careful not to pinch the wire going to the diode.

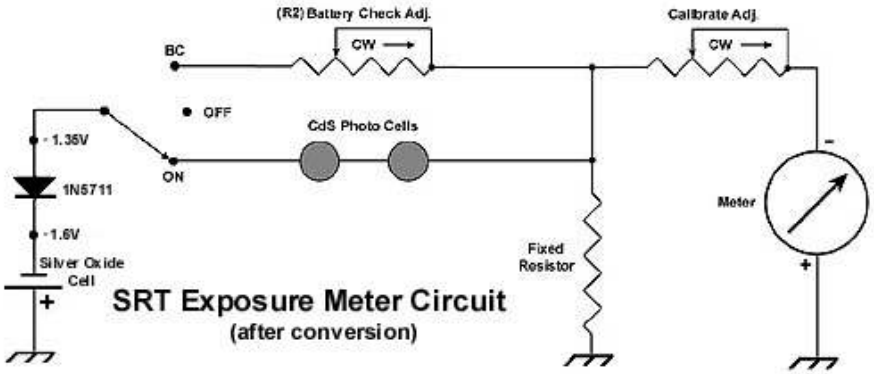
16. Install the Silver Cell with adapter or "O" Ring and screw on the battery cap.

17. Place the BC-OFF-ON switch to BC and note the position of the meter needle. It should align with the black block in the viewfinder. This is not real critical you just need to remember its position for a good battery, for later Battery Checks. Due to variations in circuit components of SRTs you may see that the needle does not exactly align with the block in the viewfinder. This is no problem and will not affect the calibration. It can be adjusted but since this is a "no adjustments" article, so I will not comment further, here.



18. After completing the above steps, and you get no reading at all, re-check your work and make sure the cell was installed correctly as to its polarity and the cell surfaces and contacts are clean. As mentioned earlier, you may have to bend the negative contact up a little for a better connection with the slightly thinner Silver Cell. Another possibility is, that you may have installed the diode backwards.

Congratulations, your Conversion is now complete. Your classic Minolta SRT now has the ability to use modern inexpensive "76" Silver Oxide Cells and produce accurate exposures. This type of conversion should also work for other cameras in Minolta's line that were designed to use Mercury Cells, such as the SR-7.



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